TOTOKU

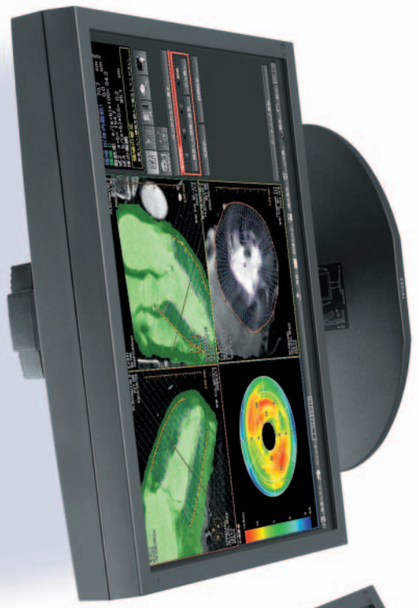
Medical display systems

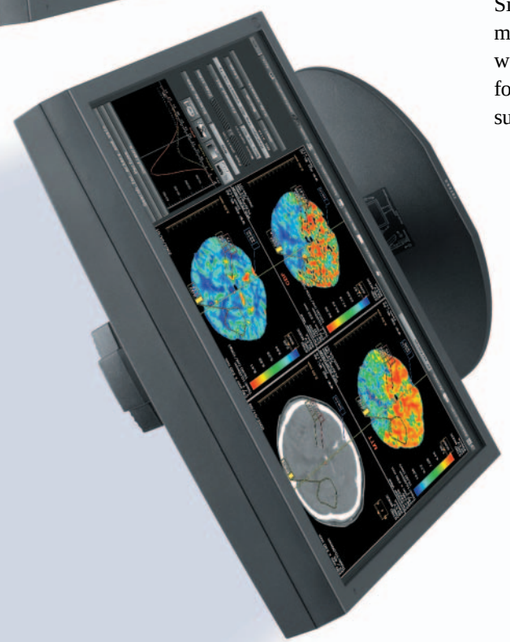
ME & CCL Series

Flat Display Systems for Medical Imaging

i model

Flat Display Systems for Medical Imaging





TOTOKU offers reliable medical image display system backed by experience and expertise

Performance and reliability through experience

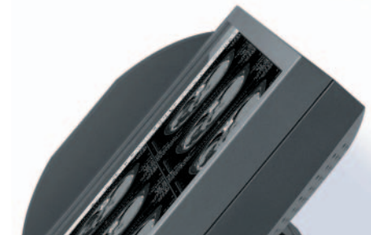
TOTOKU's high-performance and highly reliable medical image displays are backed by its unique technology and know-how through decades of solid experience in the displays industry.
TOTOKU developed displays for the first time in 1968.
Since then, TOTOKU has supplied specialized displays for medical applications, factories, broadcast stations, engineering workstations and other applications, and has earned high marks for its product liability under harsh conditions, post-installation support, and the solutions for various market needs.

TOTOKU highly reliable medical image display system

Medical image displays are required to have much higher levels of accuracy and stable luminance resistant to temperature changes and age deterioration.

Regulations and standards on display quality control for medical image displays are being established around the world. The ability to easily control and maintain display accuracy has become a necessity.

TOTOKU offers total reliable solutions, combined with displays and Medivisor series software which supports display quality control.



Higher Image Quality and Total Management

— DICOM Conformance —

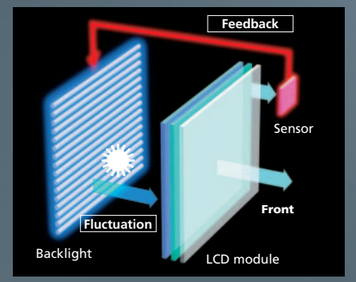
The *i model* series is the realization of high-quality images through high-performance LCD panel, unique LCD drive technology and luminance stabilizing system λ-Sentinel II. Combined with the Medivisor series software to monitor and maintain display performance, display quality control is made easy and accurate.

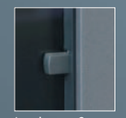
Ideal functionality required of medical imaging

Luminance stabilizing system λ-Sentinel II

λ-Sentinel II

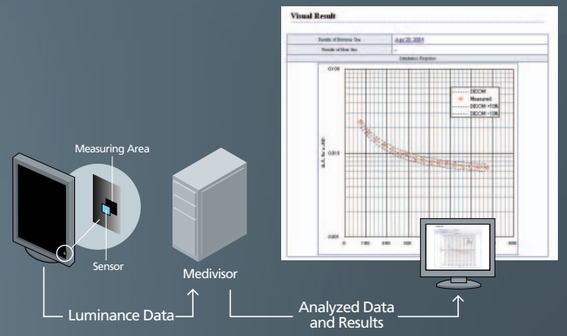
λ-Sentinel II consists of a luminance sensor and luminance control circuit. The luminance sensor attached in front of the screen constantly monitors and accurately stabilizes luminance on the screen surface by sending feedback to the control circuit.




Luminance Sensor

Features

- Along with software, DICOM GSDF conformance can be verified by analyzing luminance data according to AAPM TG18.
- Highly accurate luminance control that takes into account luminance fluctuation caused by the LCD module, is achieved.
- The display alone can measure and output the current luminance value on-screen.



Note: λ-Sentinel II module is built into the ME/CCL Series i model displays. Other models are equipped with λ-Sentinel (TOTOKU's conventional system).

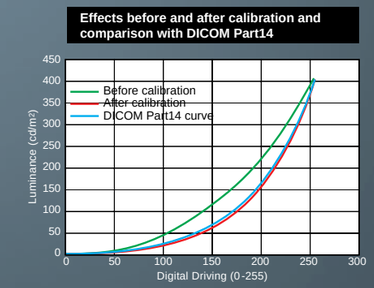
OSD Information Display

Such information as the display model, total operating time, actual measurement of luminance, and calibration settings can be checked on the screen with a push of a button.

Calibration function to accurately adjust gamma and luminance

Medical image displays are required to display grayscale according to the Grayscale Standard Display Function (GSDF) defined by DICOM Part 14. TOTOKU medical image displays are built in with the calibration function to adjust luminance levels, and grayscale characteristics to achieve DICOM GSDF compliant grayscale output.

Medivisor



Supported models: All ME/CCL Series models except ME183L and CCL192 plus
Note: An optional calibration kit is required. As for color displays, color temperature can be adjusted as well.

LED indicator

A glance at the LED indicator tells you the display's current operating status.

Luminance is being stabilized.	Luminance is being adjusted. Wait until the LED goes off.	The display is in power save mode.	An error is detected.

Worldwide medical safety and EMI standards

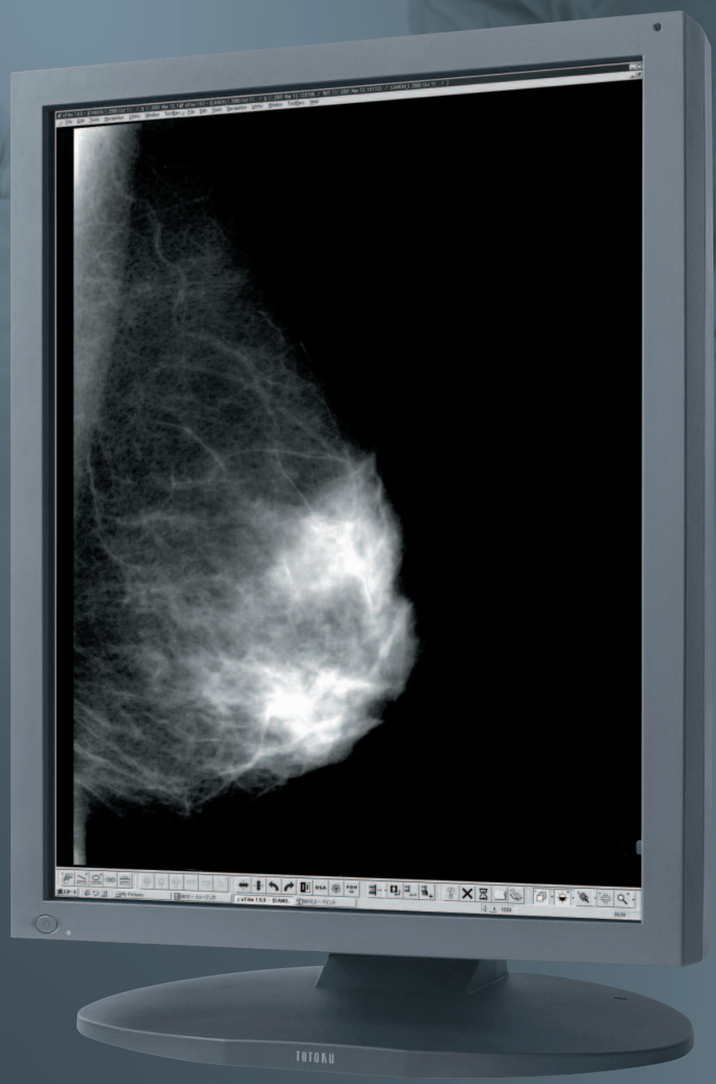
TOTOKU medical image displays comply with various stringent worldwide medical standards. They ensure safety and reliability required for use in medical facilities.

New

21.3" Monochrome Display

ME551i2

ME551i2 /C (clear base), ME551i2 /B (blue base)



5 Megapixel Monochrome Display

λ-Sentinel II

21.3" | Digital Input | High luminance 750cd/m² | Contrast 800:1 | Calibration function | 11-bit display | Color/Monochrome Conversion | OSD | Luminance Uniformity Correction | Hardware Pivot | LED Indicator | Protective filter | Multi function Stand

i model

Integration of Hardware and Software

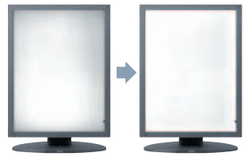
Best suited for digital mammography and other advanced applications

5 Megapixel Monochrome Display

High precision and ease of use by TOTOKU original LCD drive technology

Luminance equalizer λ-Uniformity Congruence

Is built in to achieve highly accurate luminance uniformity across the screen. Luminance unevenness is minimized in the final tune-up prior to shipping.

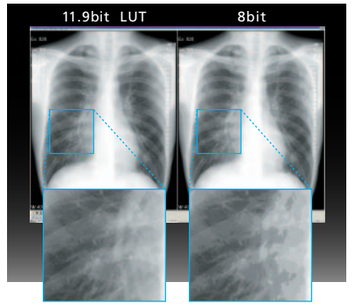


* Images shown are for illustrative purposes only.

Simultaneous display of 2048 shades of gray

2048 shades of gray (11bit) can be simultaneously displayed, combined with a viewer software. It realizes smoother grayscale display required for medical image displays.

* A viewer software that supports TOTOKU's multi-shade display system is required for 11-bit simultaneous display.



* Images shown are for illustrative purposes only.

Color/Monochrome conversion

The built-in LUT (Look-up table) converts the RGB input into a monochrome output, realizing sharp monochrome images on color systems. And multi-display setups with both color and monochrome displays can be achieved.

LUT switching function

Allows switching among 3 presets luminance and gamma using a designated software.

High speed drawing technology to realize stress-free operation

Dual Link input

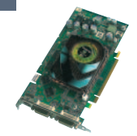
Provides smooth display of motion pictures.

Hardware-based pivoting for fast drawing in portrait orientation

TOTOKU's hardware pivot function is directly implemented in display hardware. Therefore, hardware pivoting is much faster and less noise. Unlike other pivoting functions that are dependent on graphics cards or special software.

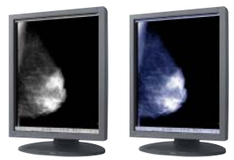
High-speed graphics card (Optional)

TOTOKU's lineup of PCI Express graphics cards, the fastest graphics card ever, enable smooth transfer of images whose size can be expected to grow even bigger in the future.



Clear base/Blue base LCD panels

The LCD panels are available in both clear and blue base colors.



Reliable products from advanced production system

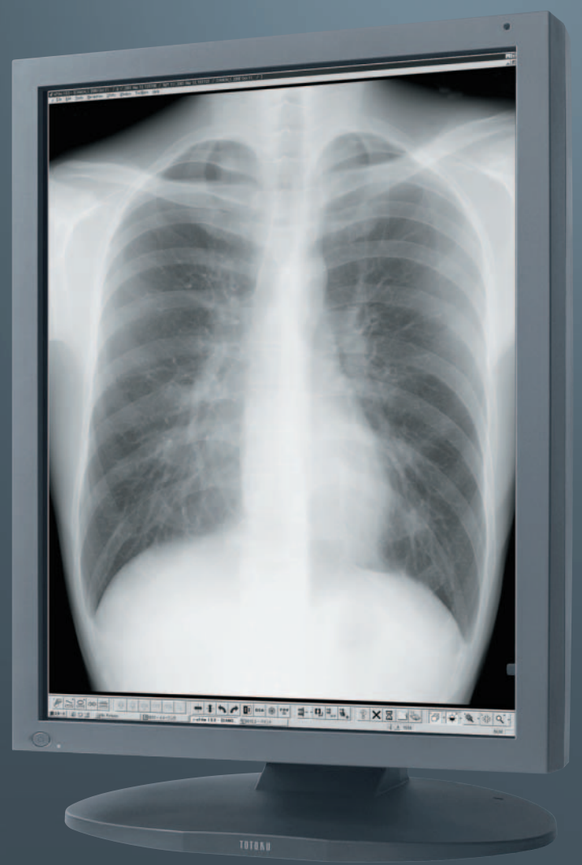
With over 30 years of experience and expertise in developing and manufacturing displays, TOTOKU delivers quality and reliable products.

Pairing service to match displayed colors (Optional)

Due to the variation in colors among cold cathode fluorescent lamps (CCFL) used as backlights, slight differences in color tone between displays are unavoidable. TOTOKU offers a display pairing service to match color tones of two displays using a high-definition spectrophotometer before shipping.

* Consult your dealer for more information about the pairing service.

3 Megapixel Monochrome Display



Excellent grayscale display of 2048 simultaneous shades with high-contrast panel

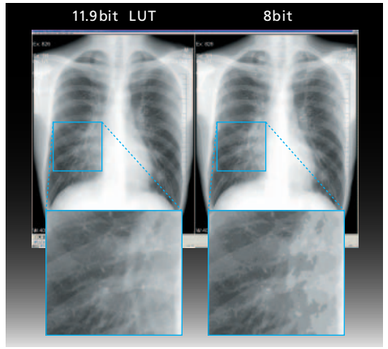
i model

High precision and ease of use by TOTOKU original LCD drive technology

Simultaneous display of 2048 shades of gray

2048 shades of gray (11bit) can be simultaneously displayed, combined with a viewer software. It realizes smoother grayscale display required for medical image displays.

* ME251i displays 1024 shades out of 3826 shades of gray.
* A viewer software that supports TOTOKU's multi-shade display system is required for 11-bit simultaneous display.



* Images shown are for illustrative purposes only.

Color/Monochrome conversion

The built-in LUT (Look-up table) converts the RGB input into a monochrome output, realizing sharp monochrome images on color systems. And multi-display setups with both color and monochrome displays can be achieved.

High luminance and long life technology

High-luminance displays reproduce diagnostic images of the same or equivalent quality as filmed images on the light box. Mounted with a luminance stabilizing system λ-Sentinel II, the stable period of luminance has increased by more than threefold. This increased longevity helps reduce replacement costs in the long run and consequently reduces your TCO.

* Comparison made with luminance being set to factory default. Implemented on ME251i.

Clear base/Blue base LCD panels

The LCD panels are available in both clear and blue base colors.

*Implemented on ME251i.

Clear Base

Blue Base

High speed drawing technology to realize stress-free operation

Hardware-based pivoting for fast drawing in portrait orientation

TOTOKU's hardware pivot function is directly implemented in display hardware. Therefore, hardware pivoting is much faster and less noise. Unlike other pivoting functions that are dependent on graphics cards or special software.

* The hardware pivot function is mounted on ME351i.

High-speed graphics card (Optional)

TOTOKU's lineup of PCI Express graphics cards, the fastest graphics card ever, enable smooth transfer of images whose size can be expected to grow even bigger in the future.

Reliable products from advanced production system

With over 30 years of experience and expertise in developing and manufacturing displays, TOTOKU delivers quality and reliable products.

Pairing service to match displayed colors (Optional)

Due to the variation in colors among cold cathode fluorescent lamps (CCFL) used as backlights, slight differences in color tone between displays are unavoidable. TOTOKU offers a display pairing service to match color tones of two displays using a high-definition spectrophotometer before shipping.

* Consult your dealer for more information about the pairing service.

3 Megapixel Monochrome Display

ME351i λ-Sentinel II

20.8" | Digital Input | High luminance 1000cd/m² | Contrast 900:1 | Calibration function | 11-bit display | Color/Monochrome Conversion
OSD | Hardware Pivot | LED Indicator | Protective filter | Multi function Stand

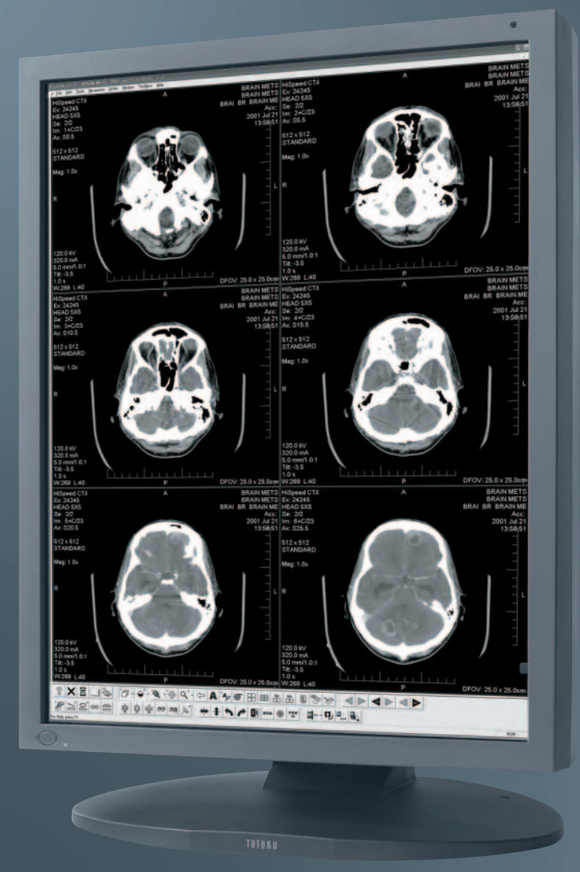
2 Megapixel Monochrome Display

ME251i /C (Clear-base)
ME251i /B (Blue-base)

ME251i Long Life λ-Sentinel II

21.3" | Digital Input | High luminance 1800cd/m² | Contrast 700:1 | Calibration function | 10-bit display
Color/Monochrome Conversion | OSD | LED Indicator | Protective filter | Multi function Stand

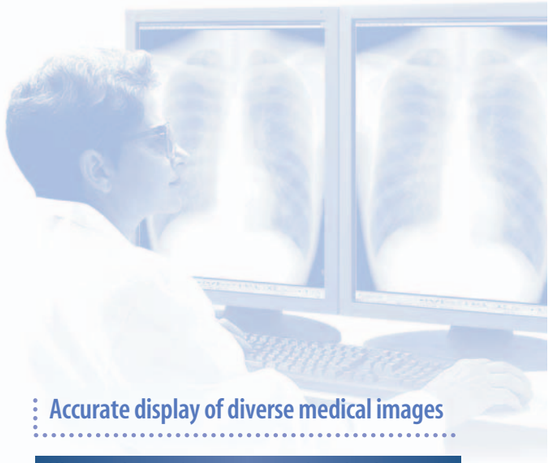
2 Megapixel Monochrome Display



Super-High luminance 1800 cd/m² and Longer Lifetime

3 Megapixel Color Display

High luminance of 400cd/m²
High-speed operation with
the Hardware pivot function



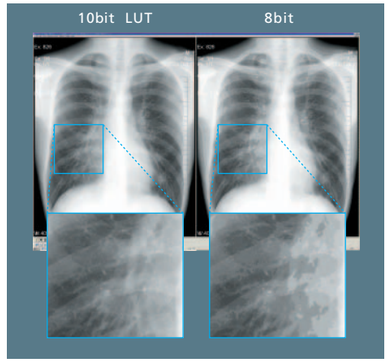
Accurate display of diverse medical images

High luminance/contrast and wide viewing angle

CCL350i and CCL250i are mounted with an LCD panel with the highest-in-class luminance, contrast, and broad viewing angle. TOTOKU's LCD drive technology achieves quality images by bringing out 100% of the LCD panel's performance. Their wide dynamic range also realizes clear display of grayscale images, which has been the challenge for conventional color displays.

Detailed grayscale display

The built-in 10bit LUT converts 8bit (256 shades of gray) data from a graphics card into DICOM GSDF-compliant detailed grayscale data.

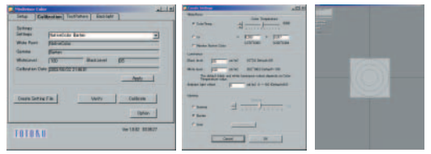


* Images shown are for illustrative purposes only.

Color calibration

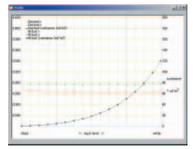
Medivisor® Color

Color calibration software Medivisor Color (included in the optional calibration kit) adjusts gamma, color temperature, and luminance to reproduce truthful colors and even out the color and luminance between displays. Medivisor Color lives up to the demanding requirements of color-sensitive applications with easy operation.



▲ Calibration procedure

Simply attach the calibration sensor to the LCD panel surface and click the start button to start calibration. It's that easy!



◀ Calibration results

Results are shown both graphically and numerically for easy comparison with the target values.

High speed drawing technology to realize stress-free operation

Hardware-based pivoting for fast drawing in portrait orientation

TOTOKU's hardware pivot function is directly implemented in display hardware. Therefore, hardware pivoting is much faster and less noise. Unlike other pivoting functions that are dependent on graphics cards or special software.

* The hardware pivot function is mounted on ME351i.

High-speed graphics card (Optional)

TOTOKU's lineup of PCI Express graphics cards, the fastest graphics card ever, enable smooth transfer of images whose size can be expected to grow even bigger in the future.

Reliable products from advanced production system

With over 30 years of experience and expertise in developing and manufacturing displays, TOTOKU delivers quality and reliable products.

3 Megapixel Color Display

CCL 350i λ-Sentinel II High Luminance

20.8" | Digital Input | High luminance 400cd/m² | Contrast 400:1 | Calibration function | 10Bit LUT
OSD | Hardware Pivot | LED Indicator | Protective filter | Multi function Stand

2 Megapixel Color Display

CCL 250i λ-Sentinel II High Luminance

21.3" | Digital Input | High luminance 450cd/m² | Contrast 450:1 | Calibration function | 10Bit LUT
OSD | LED Indicator | Protective filter | Multi function Stand

2 Megapixel Color Display

High luminance of 450cd/m²
21.3" LCD panel

Calibration function
High definition LCDs to display CT and MRI images and support various other modalities

2 Megapixel

Monochrome Display **ME201L /r**

20.1" | Analog & Digital | High luminance 700cd/m² | Contrast 1000:1 | Calibration function | 10Bit LUT | Multi function Stand

Color Display **CCL204**

20.1" | Analog & Digital | High luminance 300cd/m² | Contrast 1000:1 | Calibration function | 10Bit LUT | Multi function Stand

1.3 Megapixel

Monochrome Display **ME181L /r**

18.1" | Analog & Digital | High luminance 700cd/m² | Contrast 600:1 | Calibration function | 10Bit LUT | Multi function Stand

Color Display **CCL182 /r**

18.1" | Analog & Digital | High luminance 270cd/m² | Contrast 400:1 | Calibration function | 10Bit LUT | Multi function Stand

Calibration function

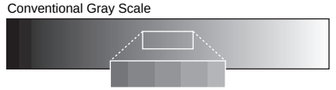
Is built in to adjust gamma, color temperature, and luminance levels to achieve DICOM GSDF compliant grayscale presentation.

Note: Calibration requires an optional calibration kit. The color temperature adjustment is for color displays only.

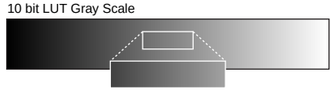
10bit LUT

Carries calibrated 10bit grayscale (1021 shades of gray) data and converts the 8bit video signal sent from a graphics card into LUT's calibrated data.

Conventional Gray Scale



10 bit LUT Gray Scale



* Images shown are for illustrative purposes only.

Luminance stabilizing system λ-Sentinel

The panel luminance changes due to age deterioration of the backlight and temperature change. The ME/CCL Series provides stable luminance resistant to such factors.

Dual digital/analog interface

Analog RGB and digital DVI inputs are supported.

Worldwide medical safety and EMI standards

TOTOKU medical image displays comply with various stringent worldwide medical standards. They ensure safety and reliability required for use in medical facilities.

Medivisor Series software (Optional)

Medivisor

The Medivisor Series software offers collective support for display quality control and delivers high-quality and stable medical images while realizing reduction in display quality management costs.

Supported models:
All ME/CCL Series models except ME183L and CCL192plus

Pairing service to match display colors (Optional)

TOTOKU offers a display pairing service that match colors of two displays using a high-definition spectrophotometer before shipping.

* Consult your dealer for more information about the pairing service.
Supported models: ME181L /r, ME201L /r

1.3 Megapixel

Monochrome Display **ME183L**

18.1" | Multi Interface | High luminance 700cd/m² | Contrast 600:1 | Preset Gamma Setting | Picture in Picture | Built-in Power supply

Color Display **CCL192 *plus***

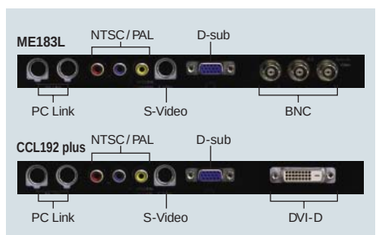
19" | Multi Interface | High luminance 450cd/m² | Contrast 600:1 | High Response LCD | Preset Gamma Setting | Picture in Picture | Built-in Power supply

Multiple interfaces and internal power supply: Perfect solution for various modalities

Multiple interfaces

Includes digital DVI, interlaced/non-interlaced analog RGB, S-Video, and NTSC/PAL composite signals.

* Digital DVI is supported by CCL192 plus only.



Picture-in-Picture

Allows you to have two screens (a TV signal and computer data) simultaneously.

* The PIP function is available for NTSC/PAL and S-Video only.

Luminance stabilizing system

Delivers stable display of images by automatically stabilizing luminance fluctuations caused by startup drift, temperature change, and age deterioration.

Internal power supply

Eliminates the need for an external AC adapter and frees more desk space.

Built-in overdrive circuit for smooth illustration of motion pictures

The overdrive circuit realizes a 12ms response time, while minimizing afterimage effects.

* Implemented on CCL192 plus.

DICOM gamma preset

6 gamma presets, including DICOM-compliant gamma, are available to cover various applications.

Worldwide medical safety and EMI standards

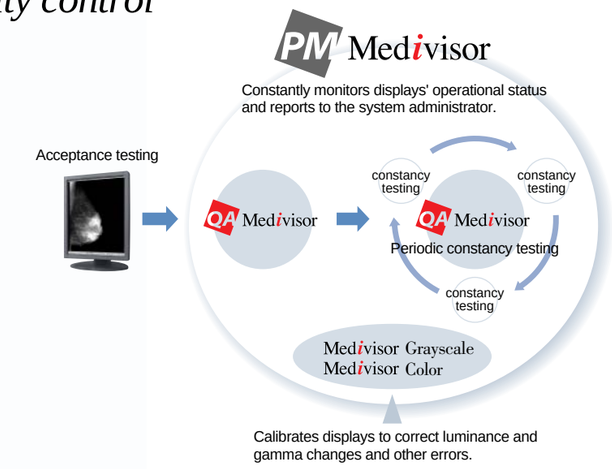
TOTOKU medical image displays comply with various stringent worldwide medical standards. They ensure safety and reliability required for use in medical facilities.

Collective support for display quality control

Medivisor® Series

(Optional software)

The Medivisor Series is a series of software to collectively support display quality control from acceptance and periodic constancy testing to constant monitoring, to calibration.



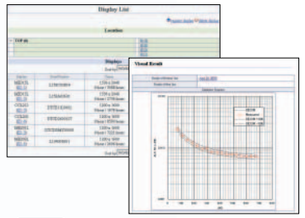
Performance monitoring software

PM Medivisor

PM Medivisor is a software that continually collects and analyzes the operational status of medical displays installed in the hospital and reports to the system administrator. The introduction of PM Medivisor can result in significant labor savings enhancements.

Centralized control of display information

PM Medivisor enables the system administrator to manage a wide range of information such as calibration history and general information of each display including operating hours.



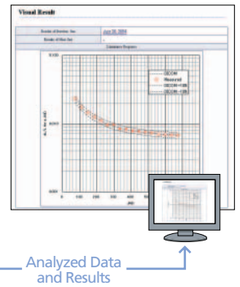
Display operational status monitoring

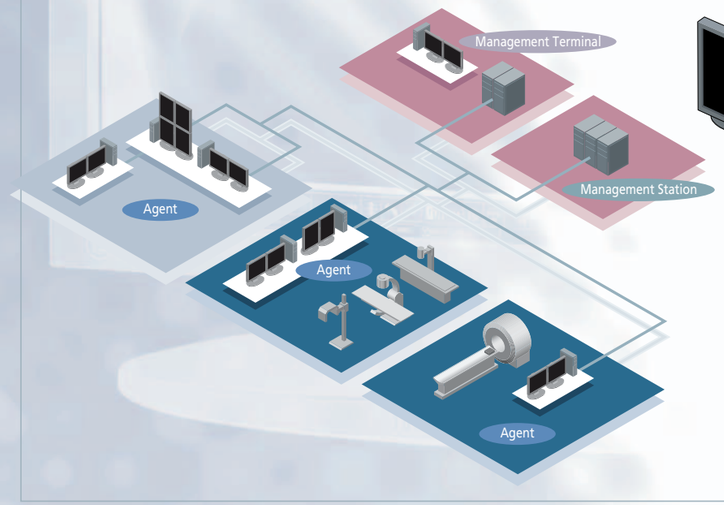
The system administrator will be notified of various information including changes in luminance, configuration change such as changes of resolution, the addition or deletion of displays and workstations.

Remote evaluation of display accuracy

Luminance data measured by the front sensor is analyzed and evaluated for its conformance to DICOM GSDF based on the guidelines of AAPM TG18.

* This function is available on the ME/CCL Series i model displays.





Other functions

- E-mail auto-delivery of alert information and other notifications
- Report generation in PDF format

◆ Performance monitoring software PM Medivisor

Supported models:
All ME/CCL Series models except ME183L and CCL192 plus

Supported operating system:
Windows XP/2000

Acceptance and constancy testing software

QA Medivisor

Acceptance and constancy tests are essential to providing and maintaining the image quality of medical image displays. QA Medivisor supports acceptance and constancy tests according to the following standards:

- AAPM TG18 - American Association of Physicists in Medicine
- DIN 6868-57V - Deutsches Institut für Normung
- JESRA X-0093-2005 - Japan Engineering Standard of Radiation Apparatus

Testing made easy and accurate. Just follow the on-screen instructions

Each standard has its own set of test items for the acceptance and constancy tests, QA Medivisor supports major standards and guides the user through the steps required for the respective standards. Acceptance and constancy tests are made easy and accurate.

Test report generation

Test procedures according to respective standards are embedded and their results can be output in PDF format. QA Medivisor also manages the generated reports.

Centralized control of test results

Test results are sent to PM Medivisor for centralized control of display performance.

◆ Acceptance and constancy testing software QA Medivisor

Supported models:
All ME/CCL Series models except ME183L and CCL192 plus

* QA Medivisor is included in calibration kit CAL008.

Calibration software

Medivisor Grayscale
Medivisor Color

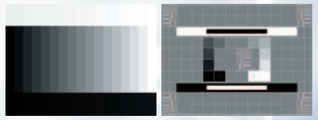
Medivisor Grayscale/Color provides accurate calibration required for medical image displays.

Calibration to DICOM GSDF

It goes without saying that maintaining grayscale accuracy is of significant importance for monochrome medical image displays. Periodic calibration provides accuracy control that conforms to the GSDF according to DICOM Part 14.

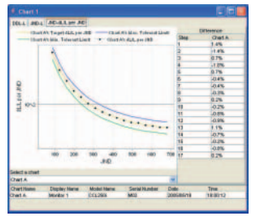
Test patterns for easy visual examination

Various test patterns are available for simple visual examination of display characteristics.



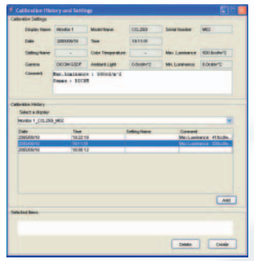
Graphical presentation of calibration results

Calibration results are shown not only numerically but also graphically providing quick and easy visual summaries.



Calibration history management

Calibration history is saved separately for each display and instant access is provided to previous calibration records.



Centralized control of calibration results

Calibration results are sent to PM Medivisor for centralized control of display performance.

Supported operating system by the following calibration software:
Windows XP/2000

◆ Models supported by Medivisor Grayscale (monochrome calibration software)

ME Series: ME181L /r, ME201L /r, ME203L, ME213L, ME315L, ME511L
ME Series i model: ME251i, ME351i, ME551i2

◆ Models supported by Medivisor Color (color calibration software)

CCL Series: CCL182 /r, CCL202, CCL204, CCL212 /r, CCL316
CCL Series i model: CCL250i, CCL350i

◆ Calibration kit CAL008

Package contents

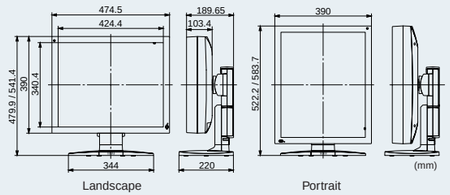
- **Calibration software:**
  Medivisor Grayscale, Medivisor Color, Medivisor for ME201L ME181L
- **GSDF Checker**
- **QA Medivisor**
- **Luminance sensor**

Specifications

5 Megapixel

Model Name		ME551i2 /C (Clear-base), ME551i2 /B (Blue-base)
LCD Panel	Technology	21.3-inch, TFT Monochrome, Active matrix
	Display Area	422.4mm X 337.9mm
	Pixel Pitch	0.165mm X 0.165mm
	Contrast Ratio	800 :1 (Typ.)
	Maximum Luminance	750cd/m² (Typ.), (calibrated to 410cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal
Visual Performance	Available Resolution	640 X 480 (VGA), 2048 X 2560 or 2560 X 2048
	Grayscale	11.9bit (3826) grayscale to 8bit (256) grayscale Along with the customized viewer software, simultaneous display of 11bit (2048) grayscale is possible.
Input Signal	Input Sync Signal	DVI 1.0 compliant
	Plug and Play	DDC2B compliant
Input Power Supply	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz
	Maximum Power Consumption	80W Typical (with power management feature)
Features	Calibration Control	Luminance, Gamma, Capability of saving 3 sets of LUT settings (A calibration kit is required.)
	OSD Information Display	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, etc.), Current luminance, etc.
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)
	Other Features	Luminance Uniformity Correction Function, Hardware Pivot function, Color/Monochrome conversion function, LED indicator
Approvals	UL60601-1, CSA C22.2 No.601.1, MDD/CE, FCC-B, VCCI-B, FDA510 (k), (MIC, CCC, : pending)	
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 474.5 (W) X 479.9 / 541.4 (H) X 220 (D) mm Portrait : 390 (W) X 522.2 / 583.7 (H) X 220 (D) mm
	Weight	Net: approx. 12.1kg, Without tiltstand: approx. 7.9kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape
	Mount	100mm VESA mounting
	Security Slot	Antitheft security slot (Panel and tilt stand)
	Protective Filter	Antireflection-coated protective filter
Accessories	AC adapter, Power cord (3P), DVI cable, USB cable, Operation manual	

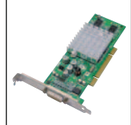
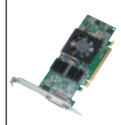
ME551i2



*These specifications are as of October 2006. They are subject to change without notice.

Graphics Cards

Totoku's lineup of PCI Express graphics cards enable smooth transfer of images whose size can be expected to grow even bigger in the future. (Optional.)

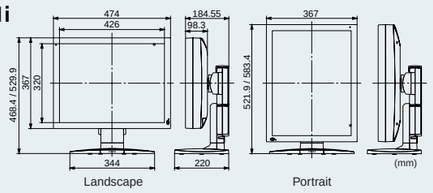
Model	LV22P2	LV22E2	LV32P1	LV32P4	LV32E2	LV33E1	LV52P1	LVU2E1
Photo								
Max. resolution	1600 X 1200 Pixels		2048 X 1536 Pixels				2560 X 2048 Pixels	
BUS	PCI 32bit(33MHz)	PCI Express X16	PCI 64bit (66MHz)/ 32bit (33MHz)	PCI 64bit (66MHz)/ 32bit (33MHz)	PCI Express X16	PCI Express X16	PCI 64bit(66MHz)/ 32bit(33MHz)	PCI Express X16
I/F	DVI X2		DVI X2			DVI X2 Analog RGB X1	DVI X2	DVI X2 (Dual-link)
Memory	64MB	64MB	256MB	128MB	128MB	128MB	256MB	256MB
OS	XP/2000/NT 4.0(SP6)	XP/2000	XP/2000/NT 4.0(SP6)	XP/2000	XP/2000	XP	XP/2000/NT 4.0(SP6)	XP/2000
Max. Power Consumption (W)	11.75W	21W	35W	15W	27W	25W	35W	65W
Outline	168 X 65mm	168 X 69mm	190 X 107mm	133 X 65mm	163 X112mm	173 X 69mm	190 X 107mm	198 X 111mm
Compatible models	ME251i, CCL250i, ME181L /r, ME201L /r, CCL182 /r, CCL212 /r		ME351i, CCL350i				ME551i2	ME551i2, ME351i CCL350i

* Despite the hardware requirements for this graphics card, some computers or software and/or a combination of both may prevent the proper installation of this graphics card. Please check with your dealer before you purchase it.

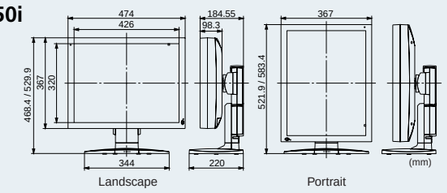
3 Megapixel

Model Name		ME351i	CCL350i
LCD Panel	Technology	20.8-inch, TFT Monochrome, Active matrix	20.8-inch, TFT Color Active matrix
	Display Area	423.9mm X 318.0mm	←
	Pixel Pitch	0.207mm X 0.207mm	←
	Contrast Ratio	900 :1 (Typ.)	400 :1 (Typ.)
	Maximum Luminance	1000cd/m² (Typ.), (calibrated to 410cd/m² by factory default)	400cd/m² (Typ.), (calibrated to 200cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	←
Visual Performance	Available Resolution	USTEXT, 640 X 480 (VGA), 800 X 600 (SVGA), 1024 X 768 (XGA), 2048 X 1536 (QXGA)	←
	Grayscale	11.9bit (3826) grayscale to 8bit (256) grayscale Along with the customized viewer software, simultaneous display of 11bit (2048) grayscale is possible.	————
	Color display	————	Full color (16.77million colors)
Input Signal	Input Sync Signal	DVI 1.0 compliant	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz	←
	Maximum Power Consumption	80W Typical (with power management feature)	83W Typical (with power management feature)
Features	Calibration Control	Luminance, Gamma, Capability of saving 3 sets of LUT settings (A calibration kit is required.)	Luminance, Gamma, Color temp., Capability to save 3 sets of LUT settings (A calibration kit required.)
	OSD Information Display	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, etc.), Current luminance, etc.	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, Color temp, etc.), Current luminance, etc.
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)	←
	Other Features	Hardware Pivot function, Color/Monochrome conversion function, LED indicator	Hardware Pivot, LED indicator
Approvals	UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, CCC, BSMI, FCC-B, VCCI-B		←
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 474.0 (W) X 468.4 / 529.9 (H) X 220.0 (D) mm Portrait : 367.0 (W) X 521.9 / 583.4 (H) X 220.0 (D) mm	←
	Weight	Net: approx. 11kg, Without tiltstand: approx. 6.8kg	←
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	Antitheft security slot (Panel and tilt stand)	←
	Protective Filter	Antireflection-coated protective filter	←
Accessories	AC adapter, Power cord (3P), DVI cable, Serial cable, USB cable, Operation manual		←

ME351i



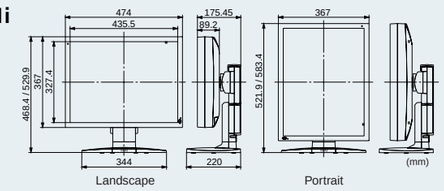
CCL350i



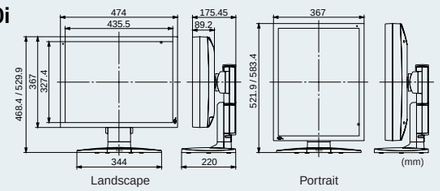
2 Megapixel

Model Name		ME251i /C (Clear-base), ME251i /B (Blue-base)	CCL250i
LCD Panel	Technology	21.3-inch, TFT Monochrome, Active matrix	21.3-inch, TFT Color Active matrix
	Display Area	432mm X 324mm	←
	Pixel Pitch	0.270mm X 0.270mm	←
	Contrast Ratio	700 :1 (Typ.)	450 :1 (Typ.)
	Maximum Luminance	1800cd/m² (Typ.), (calibrated to 410cd/m² by factory default)	450cd/m² (Typ.), (calibrated to 200cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	←
Visual Performance	Available Resolution	USTEXT, 640 X 480 (VGA), 800 X 600 (SVGA), 1024 X 768 (XGA), 1280 X 1024 (SXGA), 1600 X 1200 (UXGA)	←
	Grayscale	11.9bit (3826) grayscale to 8bit (256) grayscale Along with the customized viewer software, simultaneous display of 10bit (1024) grayscale is possible.	————
	Color display	————	Full color (16.77million colors)
Input Signal	Input Sync Signal	DVI 1.0 compliant	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (±10%) 50/60Hz	←
	Maximum Power Consumption	85W Typical (with power management feature)	←
Features	Calibration Control	Luminance, Gamma, Capability of saving 3 sets of LUT settings (A calibration kit is required.)	Luminance, Gamma, Color temp., Capability to save 3 sets of LUT settings (A calibration kit required.)
	OSD Information Display	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, etc.), Current luminance, etc.	Model name, Serial No., Total operating time, Calibration settings (Operating time from Last Calibration, Luminance, Gamma, Color temp, etc.), Current luminance, etc.
	USB Hub	USB Rev. 2.0 compliant, Self-powered USB upstream connector (x1), USB downstream connector (x2)	←
	Other Features	Color/Monochrome conversion function, LED indicator	LED indicator
Approvals	UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, CCC, BSMI, FCC-B, VCCI-B		←
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 474.0 (W) X 468.4 / 529.9 (H) X 220.0 (D) mm Portrait : 367.0 (W) X 521.9 / 583.4 (H) X 220.0 (D) mm	←
	Weight	Net: approx. 7.4kg	←
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	Antitheft security slot (Panel and tilt stand)	←
	Protective Filter	Antireflection-coated protective filter	←
Accessories	AC adapter, Power cord (3P), DVI cable, Serial cable, USB cable, Operation manual		←

ME251i



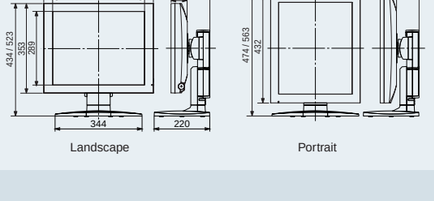
CCL250i



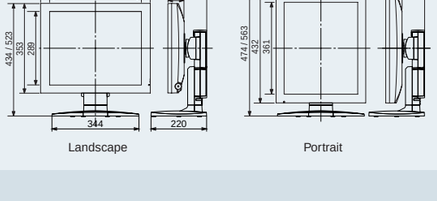
2 Megapixel

Model Name		ME201L /r	CCL204
LCD Panel	Technology	20.1-inch, TFT Monochrome, Active matrix	20.1-inch, TFT Color Active matrix
	Display Area	408.0mm X 306.2mm	408mm X 306mm
	Pixel Pitch	0.255mm X 0.255mm	←
	Contrast Ratio	1000 :1 (Typ.)	←
	Maximum Luminance	700cd/m² (Typ.), (calibrated to 410cd/m² by factory default)	300cd/m² (Typ.), (calibrated to 120cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	178° vertical and horizontal
Visual Performance	Available Resolution	640 X 480 (VGA), ~1600 X 1200 (UXGA)	←
	Grayscale	10bit (1024) grayscale to 8bit (256) grayscale	———
	Color display	———	Full color (16.77million colors)
Input Signal	Input Sync Signal	Digital DVI / Analog RGB	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (-10%, +6%) 50/60Hz	AC adapter 100V ~ 240V (±10%) 50/60Hz
	Maximum Power Consumption	50W Typical (with power management feature)	70W Typical (with power management feature)
Features	Calibration Control	Luminance, Gamma (A calibration kit is required.)	Luminance, Gamma, Color temp. (A calibration kit is required.)
	USB Hub	USB Rev. 1.1 compliant, Bus-powered USB upstream connector (x1), USB downstream connector (x2)	USB Rev. 2.0 compliant, Bus-powered USB upstream connector (x1), USB downstream connector (x2)
Approvals		UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, CCC, FCC-B, VCCI-B	UL60601-1, CSA C22.2 No. 601.1, MDD/CE, FCC-B, VCCI-B, (FDA510(k) : pending)
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 453 (W) X 461 / 523 (H) X 220.0 (D) mm Portrait : 353 (W) X 511 / 573 (H) X 220.0 (D) mm	←
	Weight	Net: approx. 11.5kg, Without tiltstand: approx. 7.1kg	Net: approx. 11.4kg, Without tiltstand: approx. 7.0kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	Antitheft security slot (tilt stand)	Antitheft security slot (Panel and tilt stand)
	Protective Filter	———	Antireflection-coated protective filter
Accessories		AC adapter, Power cord (3P), DVI cable, VGA cable, Serial cable, USB cable, Operation manual	←

ME201L /r



CCL204



1.3 Megapixel

Model Name		ME181L /r	CCL182 /r
LCD Panel	Technology	18.1-inch, TFT Monochrome, Active matrix	18.1-inch, TFT Color Active matrix
	Display Area	359.0mm X 287.2mm	359mm X 287mm
	Pixel Pitch	0.2805mm X 0.2805mm	←
	Contrast Ratio	600 :1 (Typ.)	400 :1 (Typ.)
	Maximum Luminance	700cd/m² (Typ.), (calibrated to 410cd/m² by factory default)	270cd/m² (Typ.), (calibrated to 120cd/m² by factory default)
	Viewing Angle	170° vertical and horizontal	←
Visual Performance	Available Resolution	640 X 480 (VGA), ~1280 X 1024 (SXGA)	←
	Grayscale	10bit (1021-step gradation) to 256 gradation display	———
	Color display	———	Full color (16.77million colors)
Input Signal	Input Sync Signal	Digital DVI / Analog RGB	←
	Plug and Play	DDC2B compliant	←
Input Power Supply	Input	AC adapter 100V ~ 240V (-10%, +6%) 50/60Hz	←
	Maximum Power Consumption	50W Typical (with power management feature)	←
Features	Calibration Control	Luminance, Gamma (A calibration kit is required.)	Luminance, Gamma, Color temp. (A calibration kit is required.)
	USB Hub	USB Rev. 1.1 compliant, Bus-powered USB upstream connector (x1), USB downstream connector (x2)	←
Approvals		UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, CCC, BSMI, FCC-B, VCCI-B	UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, BSMI, FCC-B, VCCI-B
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 432 (W) X 434 / 523 (H) X 220.0 (D) mm Portrait : 353 (W) X 474 / 563 (H) X 220.0 (D) mm	←
	Weight	Net: approx. 10kg, Without tiltstand: approx. 5.8kg	←
	Tilt stand	Tilt, Swivel, Portrait / Landscape	←
	Mount	100mm VESA mounting	←
	Security Slot	Antitheft security slot (tilt stand)	←
Accessories		AC adapter, Power cord (3P), DVI cable, VGA cable, Serial cable, USB cable, Operation manual	←

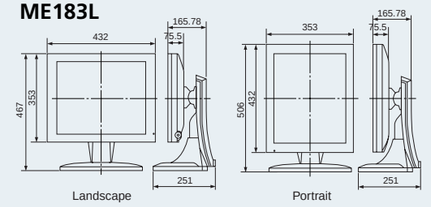
ME181L /r

CCL182 /r

1.3 Megapixel

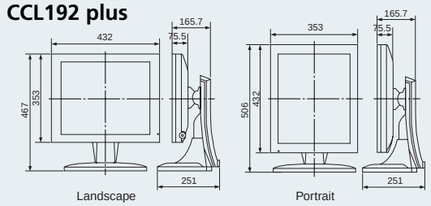
Model Name		ME183L
LCD Panel	Technology	18.1-inch, TFT Monochrome, Active matrix
	Display Area	359.0mm X 287.2mm
	Pixel Pitch	0.2805mm X 0.2805mm
	Contrast Ratio	600 :1 (Typ.)
	Maximum Luminance	700cd/m² (Typ.)
	Viewing Angle	170° vertical and horizontal
Available Resolution		640 X 480 (VGA), ~1280 X 1024 (SXGA)
Input Signal	Input Sync Signal	Analog: D-sub 15P, BNC (Sync on Video, Separate), S-Video, NTSC/PAL Composite, Y-Cb-Cr
	Plug and Play	DDC2B compliant
Input Power Supply	Input	100V ~ 240V (-10%, +6%) 50/60Hz
	Maximum Power Consumption	50W Typical (with power management feature)
Features	Gamma presets	1.6, 1.8, 2.0, 2.2, 2.4, and DICOM GSDF
	OSD Information Display	Auto adjustment, Brightness, Contrast, etc.
	Picture-In-Picture	S-Video, NTSC/PAL
Approvals		UL2601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), MIC, FCC-B, VCCI-B
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 432 (W) X 467 (H) X 251 (D) mm Portrait : 353 (W) X 506 (H) X 251 (D) mm
	Weight	Net: approx. 10.6kg
	Tilt stand	Tilt, swivel, landscape/portrait
	Mount	100mm VESA mounting
	Security Slot	Antitheft security slot
Accessories		Power cord, VGA cable, S-Video cable, Composite cable, Serial cable, User manual

ME183L



Model Name		CCL192 plus
LCD Panel	Technology	19-inch, TFT Color Active matrix
	Display Area	376mm X 301mm
	Pixel Pitch	0.294mm X 0.294mm
	Contrast Ratio	600 :1 (Typ.)
	Maximum Luminance	450cd/m² (Typ.)
	Viewing Angle	178° vertical and horizontal
Visual Performance	Available Resolution	640 X 480 (VGA), 800 X 600 (SVGA), 1024 X 768 (XGA), 1280 X 1024 (SXGA)
	Color Display	Full color (16.77 million colors)
Input Signal	Input Sync Signal	DVI 1.0 compliant, Analog RGB, Composite, S-Video, Y-Cb-Cr, NTSC/PAL (Including interlace scan mode)
	Plug and Play	DDC2B compliant
Input Power Supply	Input	100V ~ 240V (±10%) 50/60Hz
	Maximum Power Consumption	65W Typical (with power management feature)
Features	Gamma presets	DICOM GSDF, 1.6, 1.8, 2.0, 2.2, 2.4
	Color presets	Cool, Neutral, Warm, User
	OSD Information Display	Auto adjustment, Brightness, Contrast, Black level, Size, etc.
	Picture-In-Picture	S-Video, NTSC/PAL
Approvals		UL60601-1, CSA C22.2 No.601.1, MDD/CE, FDA510 (k), CCC, MIC, Ek, FCC-B, VCCI-B
Physical Characteristics	Dimensions (incl. tilt stand)	Landscape : 432 (W) X 467 (H) X 251 (D) mm Portrait : 353 (W) X 506 (H) X 251 (D) mm
	Weight	Net: approx. 9.4kg, Without tiltstand: approx. 6.7kg
	Tilt stand	Tilt, Swivel, Portrait / Landscape
	Mount	100mm VESA mounting
	Security Slot	Antitheft security slot
Accessories		Power cord (3P), DVI cable, VGA cable, S-Video cable, Y Cr Cb cable, Serial cable, Operation manual

CCL192 plus



Medical safety standards

TOTOKU medical image displays are certified under various medical safety standards in North America and EU countries where much more medical equipment are subject to significantly more stringent requirements then general IT devices, ensuring safety and reliability for use in medical facilities.

UL

UL (Underwriters Laboratories, Inc.) is an independent nonprofit testing and certification organization established in the United States. TOTOKU medical image displays are certified under UL60601-1, CSA C22.2 N601.1, thus labeled with the UL Listing Marking.

CE Marking

CE Marking is provided for products sold in European countries to indicate that the products conform to the EU Directive. Products from outside the EU sold into the EU market are required to includethis CE Marking. TOTOKU medical image displays are certified under EN60601-1-1 (medical safety standard) and EN60601-1-2 (medical EMC standard) and conform to the Medical Device Directive (MDD), and are labeled with the CE Marking.

FDA 510(k)

510(k), also known as Premarket Notification, refers to an application submitted to the Food and Drug Administration (FDA). It is an FDA national standard to allow a determination of the safety, effectiveness, and substantial equivalence of a device to a device already legally on the US market in the past or present. Its strict evaluation covers not only the safety and effectiveness of the device, but also proper labeling, including advertisements.

⚠ Safety Precautions **Please read the user's manual for safe and proper use.**

Do not expose the product to dust, moisture, steam or oily smoke. It could cause fire, electric shock, or a failure.

*These specifications are as of October 2006. They are subject to change without notice.

Integration of Hardware and Software

TOTOKU has obtained ISO14001 and ISO9001 certification which are international standards concerning environment management and quality control respectively.

ISO 14001 JQA-EM0674 ISO 9001 JQA-0679

TOTOKU

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Please contact the distributor below with inquiries and orders.

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